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SUBJECT: Submits response to NRC request on slave relay test frequency relaxation re LAR-11,dtd 941114.

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February 2, 1996

PG&E Letter DCL-96-034

U.S. Nuclear Regulatory Commission
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Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
Response to NRC Request on Slave Relay Test Frequency Relaxation Amendment (LAR 94-11, dated November 14, 1994)

Dear Commissioners and Staff:

PG&E letter DCL-94-254, dated November 14, 1994, submitted License Amendment Request (LAR) 94-11. LAR 94-11 proposed a revision to the Diablo Canyon Power Plant (DCPP) Technical Specifications (TS) to relax the slave relay test frequency from quarterly to refueling frequency. DCPP is the lead plant for the Westinghouse Owner's Group for this TS change. NRC letter dated April 27, 1995, identified six questions regarding WCAP-13878 and the reliability of Potter & Brumfield motor-driven relays (MDR) used at DCPP. PG&E responded to those questions via PG&E letter DCL-95-268, dated December 7, 1995.

In addition, the NRC Project Manger for DCPP requested that PG&E review an event related to MDR relays which occurred at the Carolina Power and Light (CP&L) Shearon Harris Unit 1 on November 5, 1995. PG&E reviewed CP&L License Event Report 95-011-00, submitted on December 5, 1995, and discussed the event with CP&L's instrumentation and controls engineers. The event does not affect the conclusions reached in LAR 94-11 or PG&E letter DCL-95-268.

On November 5, 1995, Shearon Harris Unit 1 operators were performing solid state protection system (SSPS) slave relay testing on the main steam isolation valve (MSIV) circuits. During the test, one MSIV inadvertently closed, resulting in a reactor trip and safety injection. Root cause investigations indicated that the MSIV actuation was caused by a test relay contact which failed to remain closed in a continuity test circuit. The SSPS continuity test circuits are designed to provide a current path to the MSIV solenoids while the slave relay contacts in the actuation path are cycled. The MSIV solenoids at Shearon Harris are normally

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energized, and momentary de-energization of the solenoid will allow the valve to close.

The continuity circuit design used at Shearon Harris is similar to that used at DCPP and other Westinghouse plants for normally energized solenoid loads. The continuity circuits are composed of blocking relays, test lamps, and surge suppression devices. The devices are wired in a shunt arrangement to the actuation path and do not affect operation of the safeguards equipment in their normal, non-test condition. The test circuit components, and specifically the failed test relay, do not perform safety-related functions. See Attachment 1 for a typical continuity circuit schematic and operation details.

The test relays used at Shearon Harris are Potter & Brumfield MDR Model 66-4, medium-sized, latching, 120 Vac coil relays with four contact decks. The relays are the same model as those used at DCPP and other Westinghouse plants for the test relay function. When MDR model relays are used as slave relays in the Westinghouse SSPS, small-sized, 120 Vac coil relays with two contact decks are used.

The DCPP response to the NRC, submitted in PG&E letter DCL-95-268, provides information on the differences between the small-size MDR slave relays and medium-size MDR relays used as test relays. Because of substantial differences in relay size, component differences, and internal forces required to operate the relays, the DCPP response concluded that medium-sized relay failure modes are not applicable to small-sized MDR relays.

In conclusion, because the test relay is a significantly different model than the SSPS slave relays, and because it does not have a safety-related function, the Shearon Harris event does not impact SSPS slave relay reliability. The conclusions of Westinghouse WCAP-13878 and the DCPP response to the request for additional information (ref. DCL 95-268) are not affected by this event. CP&L is still completing their evaluation of the event, but does not anticipate any new information that would affect the conclusions of this letter.

This event provides further support for eliminating quarterly slave relay testing. Quarterly slave relay testing has accelerated the failure of active continuity test circuit components during testing (test switches, push-to-test type lamps and relays). Failures of the test circuit devices result in indeterminate functionality of the associated slave relays until the failure can be diagnosed. As noted in the justification provided in DCPP LAR 94-11, and demonstrated by the event at Shearon Harris, slave relay testing has caused reactor trips and inadvertent equipment actuations.

The enclosed information does not affect the conclusions of the safety evaluation or the no significant hazards consideration determination performed for LAR 94-11.

Sincerely,

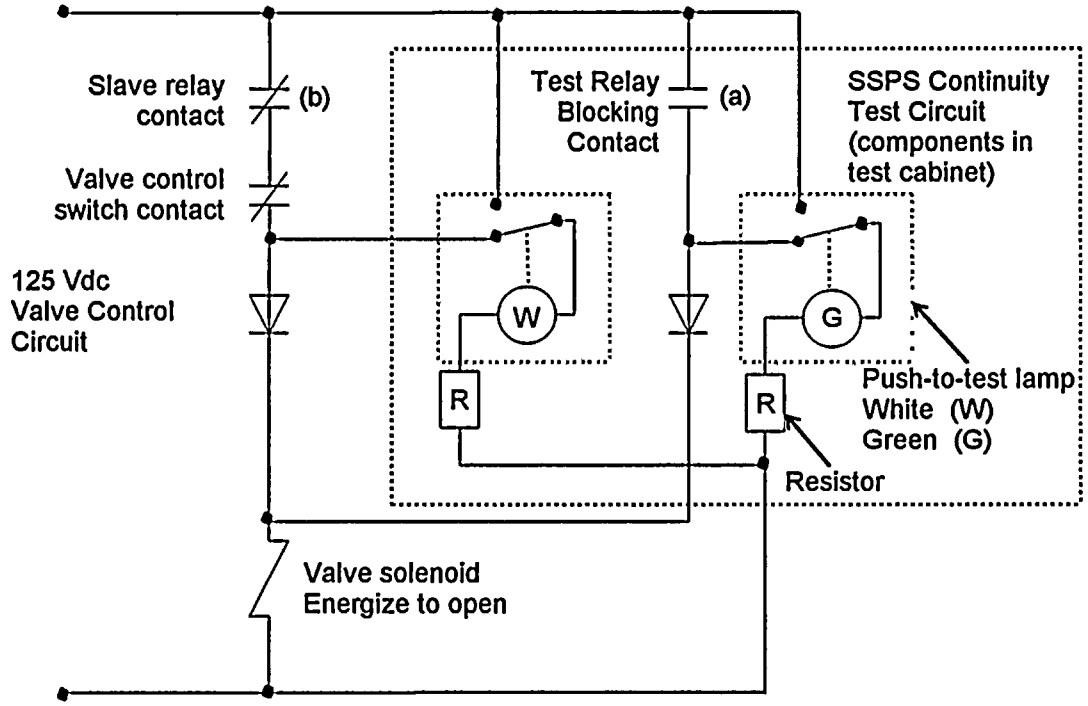
Warren H. Fujimoto

cc: Edgar Bailey, DHS
Steve Bloom
L. J. Callan
Kenneth E. Perkins
Michael D. Tschiltz
Diablo Distribution

Attachment

Attachment
PG&E Letter DCL-96-034

TYPICAL SSPS CONTINUITY TEST CIRCUIT FOR NORMALLY ENERGIZED LOADS



Note: Circuit shown in normal operating condition for an open valve. The push-to-test lamps can be depressed at any time to verify lamp will light. Additional circuitry with the slave and test relay coil energization paths is not shown.

DESCRIPTION OF OPERATION

Slave relay actuation: Solid State Protection System (SSPS) master relay energizes the slave relay. The slave relay contact shown above opens, de-energizing the valve solenoid. The valve fails closed.

Slave relay continuity test: Initial conditions are verified to be white lamp on, stays on when depressed; and green lamp off, but lights when depressed. Then, the test relay is energized, closing the test relay blocking contact and lighting the green lamp in its normal position. The blocking contact provides an alternate current path to the valve solenoid during the time the slave relay contact will be open. The lighted green lamp provides verification that the blocking contact is closed and that it is safe to proceed. The slave relay is energized, opening the slave relay contact, and the white lamp goes off to provide verification of operability. The circuit is restored to normal and the test is complete.

At Shearon Harris, when the slave relay was energized, the blocking contact failed to provide an adequate current path to the main steam isolation valve solenoid, allowing it to de-energize and close the valve.